

**Claims**

1. A method for performing random access in a mobile communication network having a base transceiver station and a plurality of mobile stations, comprising the steps of:

5 a) transmitting a parameter defining allowed access slots used between said base transceiver station and a mobile station to said mobile station;

b) determining said allowed access slots at said mobile 10 station based on said parameter; and

c) using at least one of said determined allowed access slots for performing a random access operation to said base transceiver station.

15 2. A method according to claim 1, wherein said parameter is transmitted via a broadcast channel.

3. A method according to claim 2, wherein said broadcast channel is the BCH channel of a WCDMA system.

20 4. A method according to claim 2 or 3, wherein said random access is performed via the PRACH uplink channel and the AICH downlink channel of the WCDMA system.

25 5. A method according to anyone of the preceding claims, wherein said parameter defines a subset of available access slots of said mobile communication network.

6. A method according to claim 5, wherein said subset is 30 determined by another parameter transmitted from said base transceiver station to said mobile station.

- 24 -

7. A method according to claim 6, wherein said other parameter is a timing parameter defining a transmission timing of an uplink access slot.

5 8. A method according to claim 6 or 7, wherein said other parameter is transmitted via a broadcast channel.

9. A method according to anyone of claims 6 to 8, wherein the bit number of said parameter is changed in dependence 10 on said other parameter.

10. A method according to any of the preceding claims, wherein a transmission of a preamble signature or an 15 acquisition indication is disabled in dependence of the value of said parameter.

11. A method according to anyone of the preceding claims, wherein an index of an allowed uplink access slot is calculated on the basis of the value of said parameter and 20 a frame number of a frame used for transmitting an uplink access slot.

12. A method according to claim 11, wherein said index is calculated by using the equation

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$$i = 3 \cdot N + (F \text{ modulo } 3)$$

where  $0 \leq N \leq 2$ ,

30 wherein  $F$  and  $N$  are integer numbers, and  $F$  denotes said frame number, and wherein only access slots having indices within the range 0 to 7 are valid.

13. A method according to claim 11, wherein said index is calculated by using the equation

$$i = 4 \cdot N + (\Gamma \text{ modulo } 4)$$

where  $0 \leq N \leq 3$ ,

5 wherein  $\Gamma$  and  $N$  are integer numbers, and  $\Gamma$  denotes a frame number indicating two consecutive ones of said frame numbers of said frame used for transmitting an uplink access slot, and wherein only access slots having indices within the range 0 to 14 are valid.

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14. A method according to claim 12 or 13, wherein said parameter determines an offset to be added to said calculated index.

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15. A method according to anyone of claims 1 to 11, wherein an index of an allowed uplink access slot is determined on the basis of the value of said parameter irrespective of a frame number of a frame used for transmitting an uplink access slot.

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16. A method according to anyone of the preceding claims, wherein an allowed downlink slot is determined by adding a predetermined value to an index of a received uplink slot.

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17. A method according to claim 16, wherein said predetermined value is selected in accordance with a timing parameter defining a transmission timing of said uplink slot.

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18. A method according to any of the preceding claims, wherein bit values of a binary expression of said parameter determines a combination of calculated indices obtained for other values of said parameter, said other values

- 26 -

corresponding to the binary weights of said binary expression.

19. A system for performing random access in a mobile  
5 communication network, comprising:

a) a network element (10) arranged for transmitting a parameter defining allowed access slots; and  
b) a plurality of mobile stations (20) arranged for receiving said transmitted parameter, for determining said allowed access slots based on said received parameter, and for using at least one of said determined allowed access slots for performing a random access operation to said base transceiver station (10).

15 20. A system according to claim 19, wherein said network element is a WCDMA base transceiver station (10) and said mobile station (20) is a WCDMA mobile station.

20 21. A network element for a mobile communication network comprising a plurality of mobile stations (20), comprising:

a) setting means (14) for setting a parameter defining allowed access slots for performing a random access operation; and  
b) transmitting means (11) for transmitting said parameter

25 to said plurality of mobile stations (20).

22. A network element according to claim 21, wherein said network element is a WCDMA base transceiver station (10).

30 23. A network element according to claim 21 or 22, wherein said transmitting means (11) is arranged to transmit said parameter via a broadcast channel.

24. A network element according to anyone of claims 21 to 23, wherein said setting means (14) is arranged to set said parameter in dependence on a timing parameter value defining a transmission timing of an uplink access slot in 5 said random access operation.

25. A mobile station for a mobile communication network having at least one network element (10) allowing a random access operation, comprising:

- 10 a) receiving means (21) for receiving a parameter defining allowed access slots for said random access operation from said network element (10);
- b) determining means (23) for determining said allowed access slots based on said received parameter; and
- 15 c) transmitting means (21) for transmitting a random access message to said network element (10) using at least one of said determined allowed access slots.

26. A mobile station according to claim 25, wherein said 20 receiving means (21) is arranged to receive said parameter via a broadcast channel.

27. A mobile station according to claim 26, wherein said determining means (23) is arranged to determine said allowed access slots on the basis of said received parameter and a timing parameter received via said broadcast channel.

28. A mobile station according to anyone of claims 25 to 30 27, wherein said determining means (23) is arranged to calculate an index of an allowed uplink access slot on the basis of the value of said received parameter and a frame

- 28 -

number of a frame used for transmitting an uplink access slot.

29. A mobile station according to anyone of claims 25 to 5 27, wherein said determining means (23) is arranged to determine an index of an allowed uplink access slot on the basis of the value of said parameter irrespective of a frame number of a frame used for transmitting an uplink access slot.

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30. A mobile station according to anyone of claims 25 to 29, wherein a selection means (24) is provided for randomly selecting from allowed access slots determined by said determining means (23) an uplink access slot to be used for transmitting a preamble of said random access message.

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31. A mobile station according to claim 30, wherein consecutive preambles are transmitted a predetermined number of access slots apart.

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32. A mobile station according to claim 31, wherein said predetermined number depends on a timing parameter received by said receiving means (21).

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33. A mobile station according to claim 30, wherein said selection means (24) is arranged to perform said random selection any time a preamble needs to be transmitted.

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